

Work Order ID 132993

Thursday, May 21, 2015 7:19:51 AM

132993

Page 1

Item ID: D412-664-443TRN

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Grosstube Turning Detail

Start Date: 5/21/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 5/21/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: MLJ

Date: MAY 21 2015

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start ***NR1***

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D412-664-443	REV A U/R OK

CP 15/10/15

100

0.00

100

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Cut tube on chop saw, leave extra mat'l for facing.
2-Face tube to length.

1 Ø

mm L
15/09/21

110

QC1- Inspection performed by CMM

0.00

110

QC

Memo

0.00

Quality Control

1 ✓

mm L
15/09/21

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

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Thursday, May 21, 2015 7:19:51 AM

132993

Page 2

Accept

N900040100

Setup Start *NS1*

Revision ID:

Item Name: Crosstube Turning Detail

Stop *NS2*

Start Date: 5/21/2015 **Start Qty:** 1.00 ***1***

Cust Item ID:

Required Date: 5/21/2015 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: **Process Plan:** **Date:** **Tooling:** **Date:**

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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120

0.00

120

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs on both ends
2-Turn as per Folio FB216
3- File transition lines smooth.
4-Scribe part # as per Dwg D412-664-443
FOLIO REV: AA
DWG REV: AA

7mmL
15/09/22

130

QC1- Inspection performed by CMM

0.00

130

QC

Memo

0.00

Quality Control

mmml
15/09/23

140

QC8- Inspect parts - second check

0.00

140

QC

Memo

0.00

Quality Control

15-09-24

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

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Work Order ID 132993

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132993

Page 3

Item ID: D412-664-443TRN Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Crosstube Turning Detail
 Start Date: 5/21/2015 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 5/21/2015 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150	Large Fab	0.00							
150									
Crosstubes	Memo	0.00							
Crosstubes	Grind machining marks smooth longitude way.								
180	QC15- Crossstube Dimensional Check	0.00							
180									
QC	Memo	0.00							
Quality Control									
190	Identify as per dwg & Stock Location: LG03	0.00							
190	Packaging								
Packaging	Memo	0.00							
Packaging	LOCATION : LG014								

Handwritten notes and signatures:
 BC 15/10/15
 L 15-10-15
 BC 15/10/15

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

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Work Order ID 132993

Thursday, May 21, 2015 7:19:51 AM

132993

Page 4

Item ID: D412-664-443TRN

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Turning Detail

Start Date: 5/21/2015 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/21/2015 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
200	QC21- Final Inspection - Work Order Release	0.00							
200									
QC	Memo	0.00							
Quality Control									

20151019
6/4

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width: 100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>				Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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OTHER : ☐																					

Picklist Print

Thursday, May 21, 2015 7:19:55 AM

Page 1

Work Order ID: 132993

132993

Parent Item: D412-664-443TRN

D412-664-443TRN

Parent Item Name: Crosstube Turning Detail

Start Date: 5/21/2015

Required Date: 5/21/2015

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV:A NEW ISSUE 13-09-26 JLM VERIFIED BY:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6020-160		Manufactured	No				Each	21.0000		1			
D6020-160									**				
Crosstube Material													

<u>Location</u>		<u>Loc Qty</u>	<u>Loc Code</u>
126259		21	
Hall	126259	5	
shed	126259	12	

1 mm L 15/09/21

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
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OTHER : ☐					

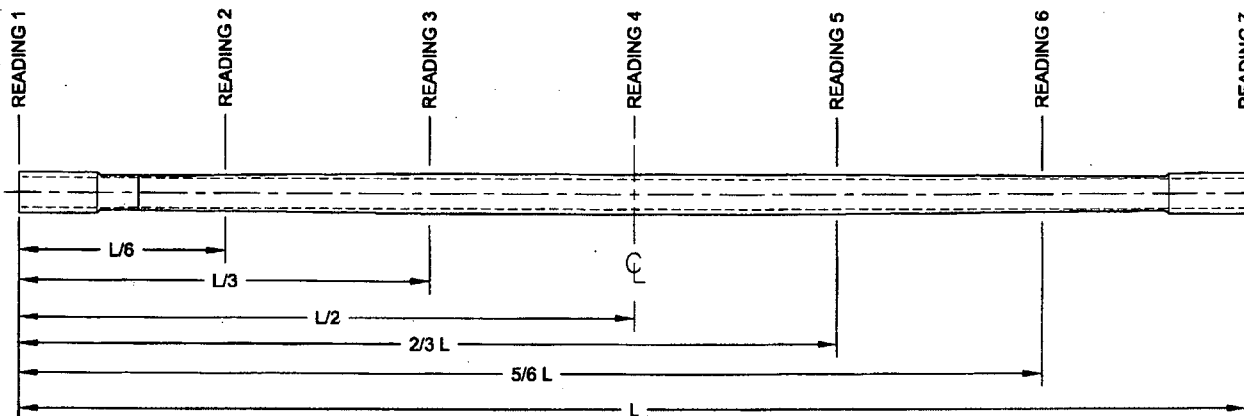
DART AEROSPACE LTD	Work Order:	132993
Description: Crosstube Assembly (412 High Aft SS)	Part Number:	D412-664-443
Inspection Dwg: D412-664-443 Rev: A		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.776	+0.005/-0.000	2.780	/		vern	CNC-08
	2.776	+0.005/-0.000	2.780	/			
	2.880	+0.005/-0.000	2.885	-			
	2.990	+0.005/-0.000	2.994	-			
	3.100	+0.005/-0.000	3.105	-			
	3.250	+0.005/-0.000	3.254	-			
	7.980	+/-0.060	8.00	/		vern	CNC-08
	0.063	+/-0.010	.063	-		RG	
	0.500	+/-0.010	.500	/		RG	
	2.990	+0.005/-0.000	2.995	/		vern	CNC-08
SIDE B	2.776	+0.005/-0.000	2.779	/		vern	CNC-08
	2.776	+0.005/-0.000	2.779	/			
	2.880	+0.005/-0.000	2.885	/			
	2.990	+0.005/-0.000	2.994	/			
	3.100	+0.005/-0.000	3.104	-			
	3.250	+0.005/-0.000	3.254	/			
	7.98	+/-0.060	8.00	-		vern	CNC-08
	R0.06	+/-0.010	.063	-		RG	
	R0.50	+/-0.010	.500	/		il	
	Ø2.990	+0.005/-0.000	2.995	/		vern	CNC-08
	130.10	+/-0.060	130.10			tape	LG-011

DART AEROSPACE LTD		Work Order: 132993
Description: Crosstube Assembly (412 High Aft SS)		Part Number: D412-664-443
Inspection Dwg: D412-664-443 Rev: A		Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.315	.316	.312	.315	-.004	0.073"
READING 2 L= 22	.203	.214	.198 .199	.203	.016	
READING 3 L= 43	.307	.327	.223 .234	.307	.020	
READING 4 L= 65	.433	.444	.413 .418	.433	.011	
READING 5 L= 87	.315	.334	.304 .322	.315	-.030	
READING 6 L= 108	.200	.213	.198 .209	.200	.015	
READING 7 L= 130	.312	.312	.315	.312	-.003	

Calibration Result

DAS
47

Actual Block Thickness: .100 - .300

Situscan 250 Measured Thickness: .100 - .500

Measured by: mgm L
Date: 15/09/22

Audited by: 9-89
Date: 15-09-24

Preliminary Approval:
Date:

Rev	Date	Change	Revised by	Approved
A	14.06.24	New Issue (P/O D412-664-403)	KJ	M

Item	Qty -443	Part Number	Description
1	X	D412-664-443	CROSSTUBE ASSEMBLY (412 HI AFT)
2	1	D6020-132	CROSSTUBE MATERIAL (132" MIN. LENGTH)
3	2	D3595-063-530	RUBBER CUSHION
4	1	D4909-1	SUPPORT
5	2	D4910-1	CHAFING SHIELD
7	4	MS21920-26	CLAMP
8	2	MS21920-28	CLAMP
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
10	A/R	PROSEAL 890	SEALANT

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6020-132
FINISHED LENGTH = 130.10±0.060 (BEFORE BENDING/TRIMMING)
- FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2, HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, REMOVE MASKING AND APPLY MATTE CLEAR COAT PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART P/N "D412-664-443" AND B/N ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)
- WEIGHT: 90.2 lb AFTER MACHINING
88.7 lb FINISHED WEIGHT
- PART IS SYMMETRIC ABOUT CENTERLINE.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

BENDING

- BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R35 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

ASSEMBLY

- INSTALL D4909-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015.
- INSTALL MS21920-28 CLAMPS WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D4909-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT.
- IF NOT ALREADY PRESENT ON CHAFING SHIELD, APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D4910-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D4910-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- TORQUE CLAMPS ON D4909-1 SUPPORT 80 TO 100 IN.-LB. TORQUE CLAMPS ON D4910-1 CHAFING SHIELD 40 TO 50 IN.-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

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132993 MLJ
15-05-21

UNDER REVIEW

4/15/20
LRF 15-561

UNDER REVIEW

4/17/20
M/M
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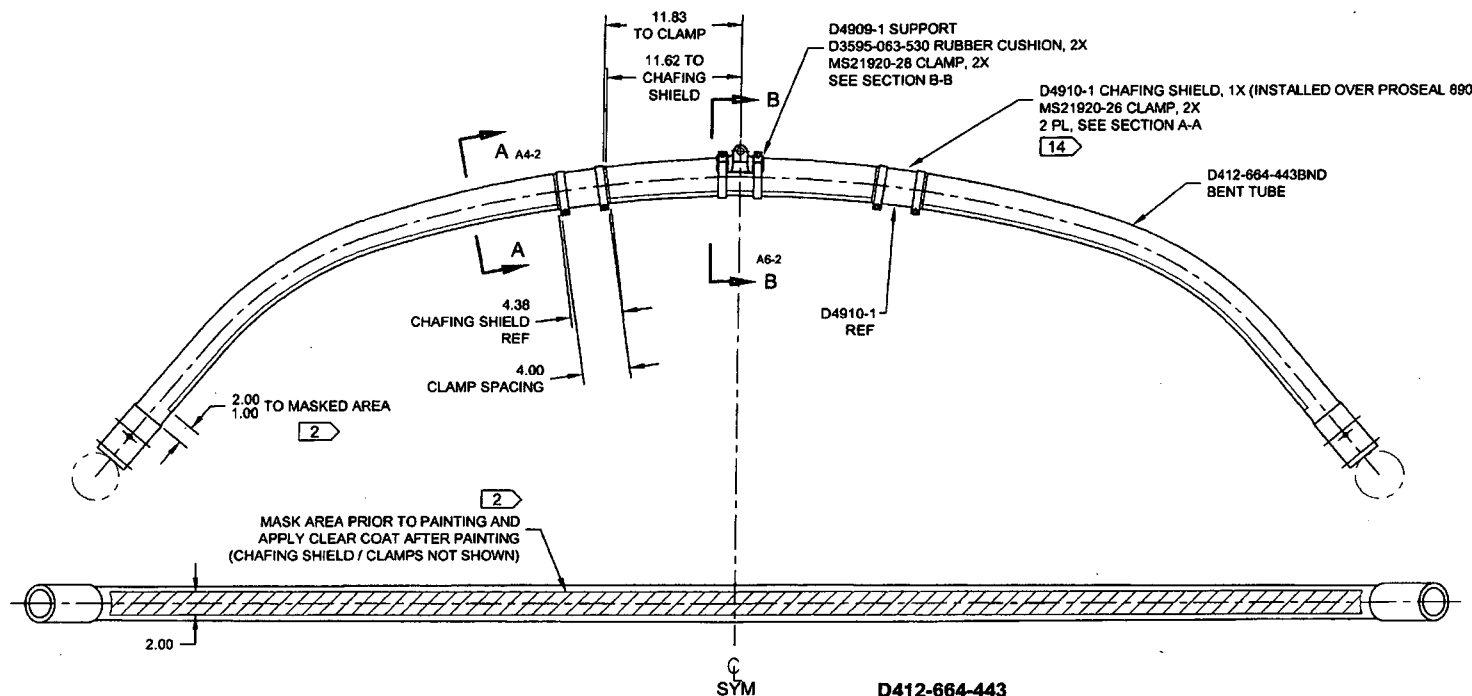
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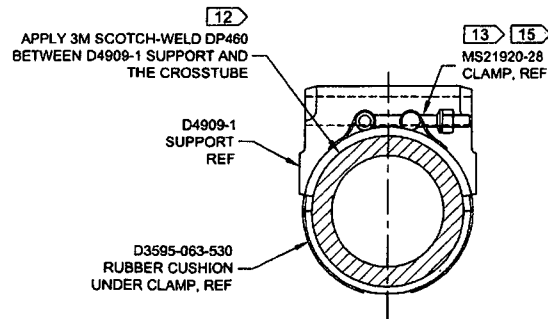
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D412-664-443 SHEET 1 OF 4

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CROSSTUBE ASSY (412 HI AFT) NTS

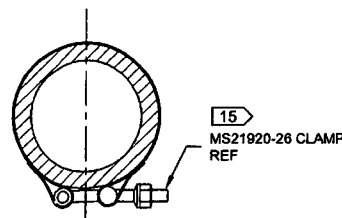
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D412-664-443
ASSEMBLY DETAIL



SECTION B-B D4-2
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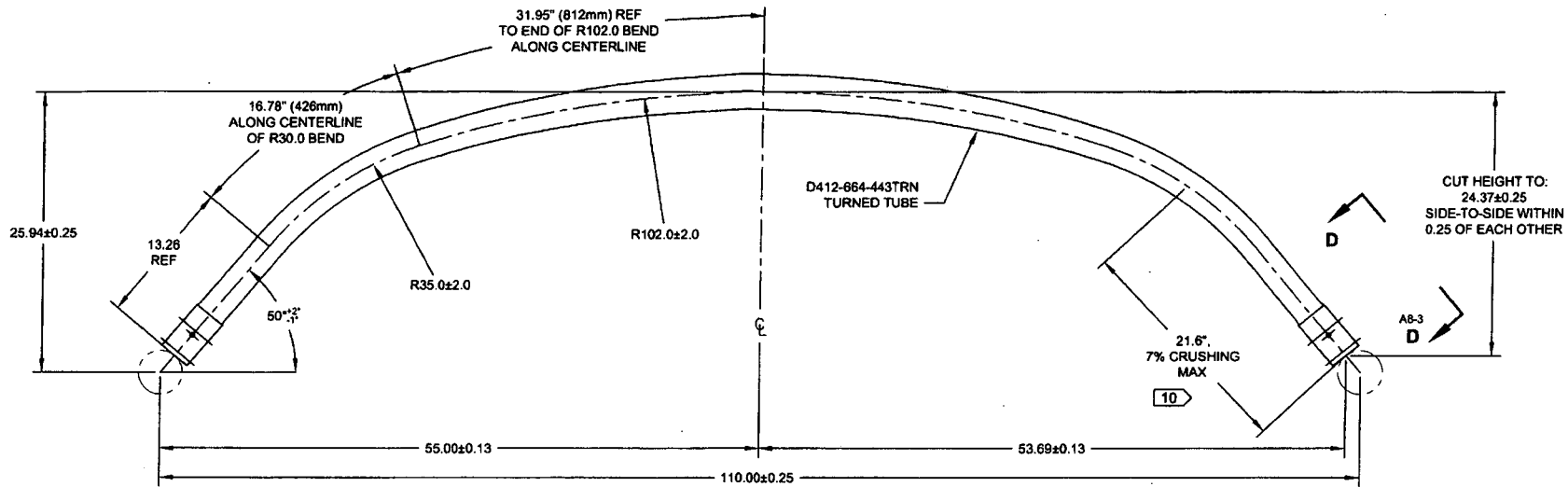
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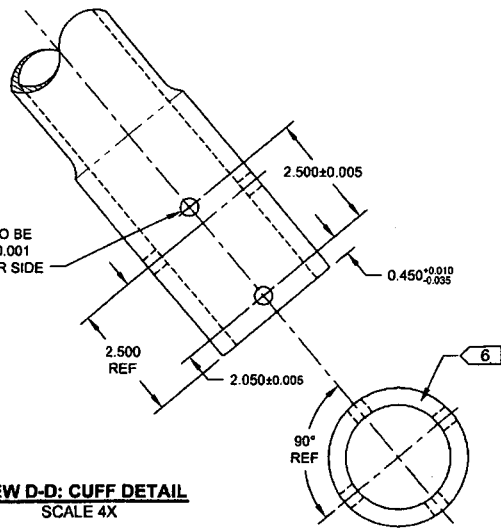
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D412-664-443BND
BENDING DETAIL

10

Ø0.386^{+0.005}_{-0.000} HOLE TO BE
ALIGNED WITHIN ±0.001
OF HOLE ON OTHER SIDE
OF CUFF
2 PL



C1-3 **VIEW D-D: CUFF DETAIL**
SCALE 4X

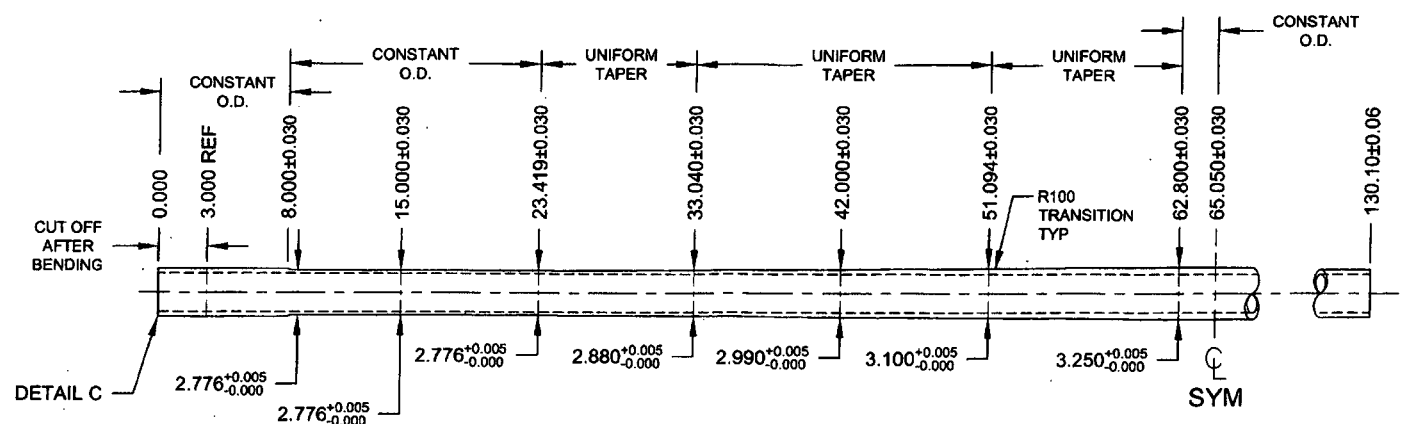
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P. 15/14/24

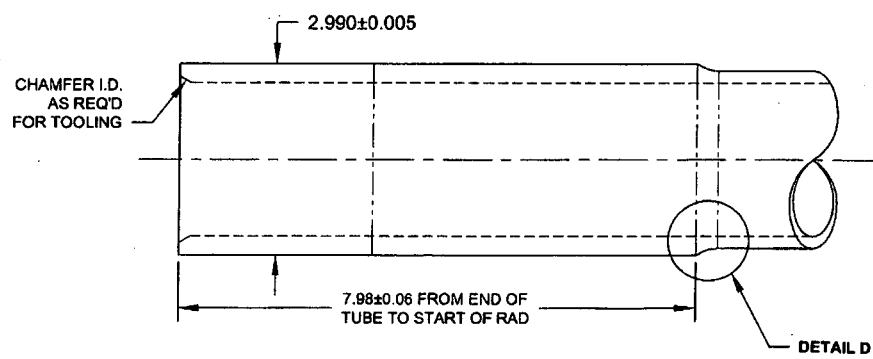
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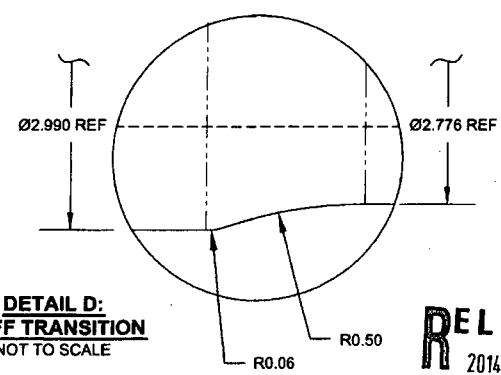


D412-664-443TRN
TURNING DETAIL

UNDER REVIEW
15/14/28



DETAIL C:
CUFF TRANSITION
SCALE 4X



DETAIL D:
CUFF TRANSITION
NOT TO SCALE

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